

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) An apparatus, comprising:
a panel positioned at least partially into a sidewall of a furnace, said panel comprising:
a plurality of openings for injecting a material through each of said openings at least partially during the same time period; and a front portion, a first side portion, and a second side portion,
wherein at least one of said openings is located in at least one of said first and second side portions, and wherein at least one of said first and second side portions is positioned at an angle that is greater than about 0 degrees from a line that is perpendicular in the horizontal plane to the front face of said panel, and wherein at least one of said first and second side portions faces away from said front portion.

Claim 2 (original) The apparatus of claim 1, wherein said furnace is associated with an electric arc furnace.

Claim 3 (canceled)

Claim 4 (currently amended) The apparatus of claim 3 1, wherein at least one of said first and second side portions is positioned at ~~a degree~~ an angle that is in a range of about 0 degrees to about 45 degrees ~~relative to said front portion with the normal reference to the panel~~ from a line that is perpendicular in the horizontal plane to the front face of said panel, and wherein at least one of said first and second side portions faces away from said front portion.

Claim 5 (currently amended) The apparatus of claim 3 1, wherein said panel comprises a central opening, first side opening, a second side opening, and a lower opening.

Claim 6 (original) The apparatus of claim 5, wherein said central opening is positioned upon said front portion.

Claim 7 (original) The apparatus of claim 6, wherein said central opening comprises a cylindrical area for stabilizing a flame.

Claim 8 (original) The apparatus of claim 7, wherein said central opening is positioned at an angle relative to a horizontal reference, such that lancing of a material is performed at an angle relative to a horizontal reference.

Claim 9 (original) The apparatus of claim 7, wherein said central opening comprises a cylindrical area that has a diameter between a range of about 38.1 millimeters to about 127 millimeters.

Claim 10 (currently amended) The apparatus of claim 7, wherein said central opening comprises a cylindrical area that has a diameter between a range of about 63.5 millimeters and about 88.9 millimeters.

Claim 11 (currently amended) The apparatus of claim 7, wherein a cylindrical path associated with the central opening has a length in the range of about 50.8 millimeters and about 254 millimeters.

Claim 12 (currently amended) The apparatus of claim 7, wherein a cylindrical path associated with the central opening has a length in the range of about 88.9 millimeters and about 177.8 millimeters.

Claim 13 (original) The apparatus of claim 7, wherein a cylindrical path associated with the central opening has a length of about 101.6 millimeters.

Claim 14 (original) The apparatus of claim 6, wherein said central opening is adapted to provide combustion oxygen.

Claim 15 (original) The apparatus of claim 5, wherein said first side opening is positioned upon said first side portion of said panel.

Claim 16 (original) The apparatus of claim 5, wherein at least one of said first side opening and said second side opening is adapted to provide a secondary combustion oxygen.

Claim 17 (original) The apparatus of claim 5, wherein said second side opening is positioned upon said first side portion of said panel.

Claim 18 (original) The apparatus of claim 5, wherein said lower opening is positioned upon a lower shell of said front portion of said panel.

Claim 19 (original) The apparatus of claim 18, wherein said lower opening is positioned at an angle relative to a horizontal reference.

Claim 20 (original) The apparatus of claim 19, wherein said lower opening is adapted to provide a particulate injection.

Claim 21 (original) The apparatus of claim 5, wherein said panel comprises a plurality of lower openings.

Claim 22 (original) The apparatus of claim 5, wherein said panel comprises a plurality of first side openings.

Claim 23 (original) The apparatus of claim 5, wherein said panel comprises a plurality of second side openings.

Claim 24 (currently amended) The apparatus of claim 5, wherein a stream of material injected through at least one of said first and second side openings is injected at an angle in the range of about 0 degrees to about 90 degrees in the horizontal relative to said front face of said front portion.

Claim 25 (currently amended) An electric arc furnace, comprising:
a roof;
a lower shell;
an upper shell comprising a an electric arc furnace portion enclosed by a sidewall; and
a panel positioned at least partially into said sidewall of said electric arc furnace portion, said panel comprising:
a front portion, a first side portion, and a second side portion; and
a plurality of openings for injecting a material through each of said openings at least partially during the same time period,
wherein at least one of said openings is located in at least one of said first and second side portions, and wherein at least one of said first and second side portions is positioned at an angle that is greater than about 0 degrees from a line that is perpendicular in the horizontal plane to the front face of said panel, and wherein at least one of said first and second side portions faces away from said front portion.

Claim 26 (canceled)

Claim 27 (currently amended) The electric arc furnace of claim 26 25, wherein said panel comprises a central opening, first side opening, a second side opening, and a lower opening.

Claim 28 (original) The electric arc furnace of claim 27, wherein said central opening is positioned upon said front portion.

Claim 29 (original) The electric arc furnace of claim 28, wherein said central opening comprises a cylindrical area for stabilizing a flame.

Claim 30 (original) The electric arc furnace of claim 29, wherein said central opening is positioned at an angle relative to a horizontal reference, such that lancing of a material is performed at an angle relative to a horizontal reference.

Claim 31 (original) The electric arc furnace of claim 30, wherein said central opening is adapted to provide combustion oxygen.

Claim 32 (original) The electric arc furnace of claim 28, wherein said first side opening is positioned upon said first side portion of said panel.

Claim 33 (original) The electric arc furnace of claim 28, wherein at least one of said first side opening and said second side opening is adapted to provide a secondary combustion oxygen.

Claim 34 (original) The electric arc furnace of claim 33, wherein said secondary combustion oxygen is controlled by a back-pressure regulator.

Claim 35 (original) The electric arc furnace of claim 33, wherein said secondary combustion oxygen is controlled by pulsating valve.

Claim 36 (original) The electric arc furnace of claim 33, wherein said secondary combustion oxygen is controlling an injector to inject the secondary combustion oxygen.

Claim 37 (original) The electric arc furnace of claim 28, wherein said second side opening is positioned upon said first side portion of said panel.

Claim 38 (original) The electric arc furnace of claim 28, wherein a lower opening is positioned upon a lower shell of said front portion of said panel.

Claim 39 (original) The electric arc furnace of claim 38, wherein said lower opening is positioned at an angle relative to a horizontal reference.

Claim 40 (original) The electric arc furnace of claim 39, wherein said lower opening is adapted to provide a particulate injection.

Claim 41 (original) The electric arc furnace of claim 28, wherein said panel comprises a plurality of lower openings.

Claim 42 (original) The electric arc furnace of claim 28, wherein said panel comprises a plurality of first side openings.

Claim 43 (original) The electric arc furnace of claim 25, wherein said roof, said upper shell, and said a lower shell define a region in which melting and refining reactions occur.

Claim 44 (original) The electric arc furnace of claim 25, further comprising a pressure regulator for controlling a primary oxygen flow and a secondary oxygen flow.

Claim 45 (original) The electric arc furnace of claim 44, wherein said pressure regulator provides a backpressure of about 75 psig.

Claim 46 (original) The electric arc furnace of claim 44, further comprising a pulsating valve for pulsing the secondary oxygen flow.

Claim 47 (currently amended) A method for increasing a spatial coverage of energy, comprising:

positioning a panel at least partially within a sidewall of a furnace, wherein said panel comprises a plurality of openings for injecting a material through each of said openings, said openings comprising:

a central opening positioned upon a front portion of said panel; and

a lower opening located below a refractory line of said furnace; and

injecting at least partially during the same time period, a primary combustion material, a secondary combustion material, and a particulate material, into said furnace through said panel, wherein said particulate matter is injected at least partially through said lower opening.

Claim 48 (canceled)

Claim 49 (currently amended) The method of claim ~~48~~ 47, wherein ~~providing said panel comprises providing~~ said injecting step injects a primary combustion oxygen,

Application No. 10/730,362
Amendment dated July 6, 2005
Reply to Office Action of March 14, 2005

a secondary combustion oxygen, and a particulate injection at least partially during the same time period.

Claim 50 (original) The method of claim 47, wherein said ~~method for increasing a spatial coverage of energy~~ includes a chemical energy, and said method further comprises a method for increasing spatial coverage of said chemical energy.

Claim 51 (new) The apparatus of claim 5, wherein said lower opening is below a refractory line of said furnace.